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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/710,769

08/02/2004

David R. Hall

66.0074

4768

38046

7590

09/26/2006

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EXAMINER

WONG, ALBERT KANG

ART UNIT

PAPER NUMBER

2612

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/710,769

Applicant(s)

HALL ET AL.

Examiner

Albert K. Wong

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2612

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 August 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) ✓
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08) ✓  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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1. This Office action is in response to the application filed August 2, 2004. This application is a CIP of 10/878,145, filed June 28, 2004. It is presumed that the claimed subject matter was first disclosed as of the filing of the instant application. If applicant disagrees, he is requested to point out support for each claim and claim element as found in the CIP application.

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilly et al (US2004/0039466). It is noted that while Patent Application Publication (PAP) '466 was published February 26, 2004, it claims the benefit of provisional application 60/383,243, filed May 24, 2002. A copy is provided. Since disclosure in both documents is essentially the same, the effective prior art date of the PAP is the filing date of the provisional application.

Regarding claim 1, Lilly teaches in Figure 1 the claimed drill string with a node connected the sub and another node at the surface that communicate with each other. This constitutes the claimed network. While burst modulation techniques is not explicitly taught, Page 6, paragraph 61 teaches the use of an Ethernet modem, which typically has a burst mode, and paragraph 52 teaches the dumping of memories. These suggest the claimed burst modulation techniques. It would have been obvious to use burst modulation as suggested by the reference. Lilly does not explicitly teach a transmission line integrated into the drill string. Lilly teaches that the sub and the surface node communicate via N different busses (paragraph 12) and

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the Ethernet modems modulate a co-axial cable (paragraph 61). The coaxial cable/busses are equivalent to the claimed transmission line. It would have been obvious to integrate the transmission line into the drill string since the cable runs between the sub and the surface via the drill string. See figure 1. Figure 2 of Howard teaches a drill string with transmission line integrated into the drill string. It would have been obvious to combine the teachings since they perform a similar function of transmitting data from a sensor to the surface via a drill string and because of the suggestion of Lilly.

Regarding claim 2, Lilly teaches the use of modems for bi-directional communication. It would have been obvious to use burst modems at each node for high-speed communication.

Regarding claim 3, Ethernet communication as taught in Lilly uses data packets.

Regarding claim 4, it is conventional to use an automatic gain control to automatically adjust the signal strength. It would have been obvious to use conventional means for their known functions.

Regarding claim 5, it is conventional for a data packet to include a preamble. It would have been obvious to use conventional means for their known functions.

Regarding claim 6, it is conventional for a signal between modems to have an unmodulated carrier to synchronize the modems via determine the carrier frequency. The unmodulated portion would be placed before the data so that communication may be established first. The first data in a packet is the preamble. It would have been obvious to use conventional means for their known functions.

Regarding claims 7-8, preambles with timing sequences and codes are conventional. The time sequence permits the decoding of the packet and the unique code allows a particular node to be addressed. It would have been obvious to use conventional means for their known functions.

Regarding claim 9, the recited modulation techniques are conventional. It would have been obvious to use conventional means for their known functions.

Regarding claim 10, Lilly teaches the interface of a downhole tool or sensor with a communication node (e.g. sub).

Regarding claim 11, this claim is essentially the same as claim 1 with the specification of a burst modem. The prior elements have been addressed above. Lilly teaches the use of Ethernet modems. These have burst capability. Thus, the claimed burst modems are taught.

Regarding claims 12-19, these limitations have been addressed above.

Regarding claim 20, it is noted that the preamble is given no patentable weight. Thus, the recitation of a drilling communication network is considered an intended use. The claim essentially recites a plurality of nodes with burst modems. System of this type are commonly found in wireline logging tools. Within the context of Lilly, it has been shown above that the use of burst modems to communicate between nodes is obvious. While the preferred embodiment in Lilly uses two nodes (paragraph 57), it would have been obvious that the system may be extended to include additional nodes. Further, Lilly teaches that software may be used to enable server functions that typically include communication with multiple nodes.

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other prior art teachings of drill pipe with integrated transmission lines includes Hall (6,392,317) and Boyle (US2002/0193004). Montgomery a modem communication system

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communicating via a logging cable. There is a discussion about protocols, packets, and superpackets which are essentially burst modes. Montgomery also suggests the use of the system in a drilling environment. Tubel teaches a downhole network.

5. It is suggested that applicant amend the claims to include limitations specific to the transmission system disclosed in Paten 6,670,880. The combinations of burst mode communications with the limitations of the specific transmission system may recite patentable subject matter. However, no determination has been made at this time.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Albert K. Wong whose telephone number is 571-272-3057. The examiner can normally be reached on M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wendy Garber can be reached on 571-272-7308. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Albert K. Wong  
September 20, 2006

A handwritten signature in cursive script, appearing to read 'AKW', followed by a horizontal flourish.

ALBERT K. WONG  
PRIMARY EXAMINER